

Index map of Augustine Island showing field stations occupied by geologists during 2006 and 2008 field seasons.

DESCRIPTION OF MAP UNIT

*Destroyed or completely covered by later activity

[For more complete descriptions of the flowage deposits, refer to Vallance and others (this

Effusive Phase and After (March 3–May)

Post-eruption block-and-ash-flow deposits—Poorly sorted, fragmental deposits with blocks typically <1 m in diameter. Formed by rock avalanches from the west margin of the north lava flow in April and May 2006. Each debris lobe is 0.5–4 m thick, as much as 1.3 km long and 350 m wide. Pba deposits comprise, on average, 60% dense low-silica andesite clasts, 30% oxidized andesite clasts, and a few percent each of high-silica andesite, banded, and hydrothermally altered clasts

Talus aprons around lava flow bases—Cones comprising poorly sorted, commonly oxidized proximal rockfall deposits from the steep fronts and margins of the north and northeast lava flows. Overlies unit Efba

Effusive-phase block-and-ash-flow deposits—Black, lobate, poorly sorted fragmental deposits that, in most places, overlie unit Cpf. Generated from the fronts of the north and northeast lava flows and also traveled down the east chute from the top of the northeast lava flow. Proximal Efba underlies Eflf. The longest flow lobe measures 2 km from the toe of the northeast lava flow to its terminus; individual lobes are less than 50 m wide. Efba deposits predominantly contain clasts of dense, low-silica andesite with lesser amounts of oxidized andesite, intermediate andesite and high-silica andesite clasts. Deposition likely began during the second half of the continuous phase

Effusive-phase lava flows—Rubbly, steep summit lava dome that overlies the north half of Augustine's summit and spills north and northeast to form two blocky lava flows. Flows are 700 and 900 m long and have prominent lateral levees and steep flow fronts as high as 85 m. Samples collected from the dome and flows are low-silica andesite (Larsen and others, this volume). The north lava flow began forming during the waning second half of the continuous phase, stopped growing during the hiatus, and renewed growth during the effusive phase. The northeast lava flow formed entirely during the effusive phase

Continuous Phase (January 28–February 10)

Continuous-phase pyroclastic-flow deposits—Voluminous composite fans, tens of meters thick, on the north and northeast flanks include multiple light-gray, poorly sorted, blocky, fragmental pyroclastic-flow deposits that overlie slopes between the summit and 100 m asl. Deposits contain subequal amounts of dense intermediate-silica andesite and high-silica andesite clasts, with lesser amounts of dense low-silica andesite and banded clasts. Voluminous lobes with blocky levees were emplaced from January 28–February 3, but small lobes were emplaced from February 3–10

Continuous-phase pyroclastic-current deposits—Deposits form margins of select Cpf or Cpfw flows or drape adjacent topographic highs. Deposits are generally <0.2 m thick, thin laterally to a feather edge, and, in some cases, consist only of scattered juvenile clasts on pre-2006 surfaces

Windy pyroclastic-flow deposit—A voluminous deposit emplaced from a single pyroclastic flow on the northwest flank of the volcano. This anastomosing deposit overlies topographic lows to an elevation of 50 m asl. Light gray and composition nearly identical to deposit Cpf, it contains blocks as much as several m across that commonly form levees along wide, flat channel bottoms. The flow destroyed campaign broadband seismic station AU12 at 0325 AKST on January 30

Explosive Phase (January 11–28)

Rocky Point pyroclastic-flow deposit—Light-gray, poorly sorted fragmental deposit extends nearly 5 km from the summit to within 1 km of north shoreline of the island and filled a small pond near its toe. Contains mostly high-silica andesite clasts, with lesser dense intermediate andesite, dense low-silica andesite, and low-silica andesite scoria. Contains blocks as large as 8 m in diameter. Along its axis, it is 10–15 m thick but thins to a feather edge at its margins and lacks prominent levees. RPpf is the single largest flow deposit formed during the eruption; it covers 3 km² and is roughly 16x106 m³ in volume. It was likely emplaced during explosive event 10 at 2024 AKST on January 27 and overlies unit Expc. Unit Cpf overlies and conceals the upper reaches of unit RPpf

Explosive-phase pyroclastic-current deposit—This medium-gray, fragmental pyroclastic deposit overlaps the prehistoric North slope lava flow and underlies RPpf. Contains high proportions of dense clasts and has friable coarseash matrix. Contains nearly subequal amounts of dense low-silica andesite, dense intermediate andesite, and high-silica andesite; contains <8% each of low-silica andesite scoria and banded clasts. The unit is as thick as 150 cm but thins to a feather edge; singed alders near its margin indicate it was inflated and hot during emplacement. Contains debris of seismic station AUL, which ceased operation on January 27, during explosive event 10

Explosive-phase lava dome 2—Massive, light-gray blocky lava dome exposed on southern portion of Augustine's summit. Overlies Exd1 and underlies Eflf. Its surface texture is extremely rugged and vesicular. Samples from this dome are high-silica andesite. It effused between January 17 (event 9) and January 27 (event 10)

Explosive-phase lava dome 1—Dark-gray, north-south-elongate lava dome composed of low-silica andesite that erupted on east half of Augustine's summit that underlies Exd2 and Eflf. Unlike other effusive units of the 2006 eruption, its surface is smooth. It effused between January 14 (event 8) and January 17 (event 9)

Explosive-phase lahar deposits—Fragmental, waterlain deposits that underlie the middle to lower parts of most drainages around the volcano, except to the west. Most widespread deposits contain boulder-rich levees flanking erosional surfaces along their upper extents and 30–100-cm-thick channel facies with intermediate sorting, crude bedding, and both inverse and normal grading downslope. Some lahars have margins bordered by cogenetic mixed-avalanche deposits (Exma). Smallest deposits appear to be fluid breakaways from the toes of Expf lobes. Rich in low-silica andesite scoria clasts. Photographs show that all Exlh deposits formed on January 13 and 14 during explosive events 3–8. Flows reached the coastline in at least six places

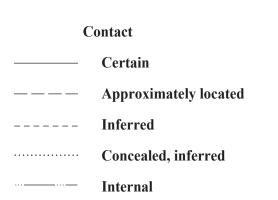
Explosive-phase mixed-avalanche deposits—Poorly sorted, massive, fragmental deposits, 20–300 cm thick, with distinctive lumpy, cracked surfaces and broadly lobate margins. Deposits originally consisted of low-silica andesiterich juvenile pyroclastic debris, pre-2006 debris, and snow, but the snow subsequently melted by the end of summer 2006. On south flanks, deposits are adjacent to or downslope of explosive-phase pyroclastic deposit and form margins and islands adjacent to Exlh deposits. Deposits formed during explosive events 3–8, when snow covered most slopes of the volcano

Explosive-phase pyroclastic-flow deposits—Poorly sorted, massive, ungraded to inversely graded fragmental deposits with blocky, lobate margins and levees. Individual flow lobes are 50–200 cm thick, 5–30 m across, and funnel into topographic lows on all flanks of the volcano except to the west, extending to altitudes as low as 150 m asl. Deposits are rich in low-silica andesite scoria (62%), with 11% each of dense low-silica andesite and high-silica andesite, 10% dense intermediate clasts, and less than 4% each banded and oxidized clasts. All Expf flows emplaced during explosive events 3–8. Flows always overlie unit Expct

Explosive-phase pyroclastic-current deposits, thin—Commonly <30-cm-thick, laterally widespread, fragmental pyroclastic deposits that are typically poorly sorted, massive, and ungraded. In distal areas to the east, deposits are as thick as 120 cm with inversely graded, crudely stratified basal facies underlying massive 20–30-cm-thick facies. Deposits drape the upper, steep northeast-to-southeast sector of the volcano to altitudes as low as 300 m. Deposits lack levees and thin toward margins on pre-2006 surfaces. In August 2006, some deposits overlay snow. Unit is richest in low-silica andesite scoria, with roughly equal amounts of dense low-silica andesite, dense intermediate andesite, and high-silica andesite, and a few percent each oxidized and banded clasts. Expct deposits were generally emplaced during explosive events 3 and 4. Differentiated from Expf by sheet-like nature, smaller grain size, and thinner deposits

Undifferentiated 2006 deposits

2006 Proximal fall deposits—Thick, layered, tephra-fall deposits that drape the south half of the summit and its west shoulder. Deposits now fill the 1976 moat to the level of the 1964 scarp, a height of 40 m



— Volcanic fissure



Photograph of Augustine's southeast flank, May 23, 2006. Light gray Expf deposits are visible in the foreground, and the 2006 lava dome (Eflf) is visible at the right half of the summit. Photo by M.L. Coombs.

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